

STATE OF ALASKA

*Jay S. Hammond, Governor*



Annual Performance Report for

EVALUATION OF INTERIOR ALASKA  
WATERS AND SPORT FISH WITH  
EMPHASIS ON MANAGED WATERS,  
DELTA DISTRICT

by

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## RESEARCH PROJECT SEGMENT

State: ALASKA Name: Sport Fish Investigations  
of Alaska

Project No.: F-9-9

Study No.: G-III Study Title: LAKE AND STREAM INVESTIGATIONS

Job No.: G-III-I Job Title: Evaluation of Interior Alaska  
Waters and Sport Fish with  
Emphasis on Managed Waters,  
Delta District

Period Covered: July 1, 1976 to June 30, 1977.

## ABSTRACT

Two study sections in the lower Goodpaster River were sampled by electro-fishing in late June, 1976, to determine population levels of Arctic grayling, Thymallus arcticus (Pallas). Age and length data were also collected.

The Petersen estimate for grayling over 150 mm in Section 2 (km 4.8-9.6) and Section 6 (km 24-28.8) is 323 grayling/km and 368 grayling/km, respectively. The estimate for the two sections combined is 351 grayling/km (563 grayling/mi).

Age class IV comprised 36% of the sample. The mean length of 120 grayling was 214 mm. Grayling greater than 289 mm comprised only 2% of the total.

Capture rate and relative abundance of all species captured in the Goodpaster River are presented. Relative abundance of grayling, round whitefish, Prosopium cylindraceum (Pallas), and longnose suckers, Catostomus catostomus (Forster), as revealed by fish/hour in the two sections combined was 78, 31 and 19, respectively.

Shaw Creek was also sampled with electrofishing gear to determine relative abundance of existing fish species. Grayling, round whitefish and longnose suckers were captured at a rate of 23, 7, and 33 fish/hour, respectively. Age class II was the most frequently captured age group. These fish had a mean length of 168 mm. Mean length of the total sample was 195 mm.

angler pressure and sport fish harvest estimates were made for several high use waters utilizing combined vehicle counts and personal interviews. An estimated 18,295 man-days of effort were recorded on Quartz Lake. Estimated total harvest of rainbow trout, Salmo gairdneri Richardson, was 8,180 from mid May to October 8. Catch success was 0.13 fish/hour, down from 0.43 in 1975.

Total man-days of fishing effort on Fielding and Tangle lakes was 7,749 and 9,947, respectively for the period from June 15 to September 5. The estimated fish harvest (principally grayling) was 10,600 on Fielding Lake and 20,351 on Tangle Lakes.

A total of 748 man-days of angling was expended on George Lake and an estimated 1,700 northern pike, Esox lucius Linnaeus, were harvested.

Silver salmon, Oncorhynchus kisutch (Walbaum), enumerated in the Delta Clearwater River and Clearwater Lake outlet totaled 1,920 and 460, respectively in October. An experimental egg take utilizing 66 females provided a total of 206,000 eggs.

Fourteen lakes stocked with rainbow trout or silver salmon or both were sampled to evaluate survival and growth. Netting results are summarized and possible factors affecting survival and growth are discussed.

## BACKGROUND

The recreational fisheries in the upper Tanana River drainage generally fall into three categories: stream fisheries, lakes with indigenous fish species, and stocked lakes.

The principal fish species of recreational importance in area streams are Arctic grayling, Thymallus arcticus (Pallas), and round whitefish, Prosopium cylindraceum (Pallas).

Lakes at lower elevations (generally below 2,000 feet) that connect to a river system usually contain native fish populations of northern pike, Esox lucius Linnaeus, burbot, Lota lota (Linnaeus), and whitefish, while lakes at higher elevations support populations of lake trout, Salvelinus namaycush (Walbaum), grayling, whitefish and burbot.

Landlocked lakes are typically barren. Since statehood most lakes near the highway system have been surveyed. Several lakes which were found to contain undesirable fish populations have been chemically rehabilitated. Many capable of supporting fish have been stocked with rainbow trout, Salmo gairdneri Richardson, or silver salmon, Oncorhynchus kisutch (Walbaum). Various stocking rates, sizes, strains and timing have been assessed to provide optimum survival and growth of stocked fish.

Research and management of selected waters are directed at monitoring fish population levels and angler utilization.

## RECOMMENDATIONS

1. Continue the sampling of established study sections on the Q River to determine population levels, age, length and species composition.
2. Expand fish population surveys on Shaw Creek to include upper portions of the stream.
3. Continue to evaluate survival and growth of stocked rainbow trout and silver salmon in selected lakes.
4. Monitor angler use and sport fish harvest on Quartz Lake, Georgia Lake and other area waters.
5. Enumerate salmon escapement in the Goodpaster and Delta Clearwater rivers.

## OBJECTIVES

1. To assess the environmental characteristics and fish species composition of the waters of the job area and, where practical, obtain estimates of existing or potential angler use and sport fish harvest.
2. To evaluate application of fishery restoration and enhancement measures and determine availability of sport fish egg sources.
3. To evaluate stocking policies for rainbow trout and silver salmon and formulate stocking recommendations for optimum survival and growth.
4. To assist as required in the investigation of public access status to the area's recreational fishery waters.

## TECHNIQUES USED

A boat mounted electrofishing unit described by Van Hulle (1968) was used to capture fish for population studies in the Goodpaster River and Shaw Creek.

Population estimates were based on a ratio of marked to unmarked fish in the sample using the Petersen equation described by Ricker (1958).

Fish were measured to fork length in millimeters.

Car counts at selected waters were made utilizing a Streeter Amet Traffic counter, and creel census data were derived from angler interviews.

Salmon enumeration was done from a riverboat utilizing a platform elevated approximately 6 feet.

Graduated mesh monofilament gill nets, 125' x 6' with five mesh sizes ranging from 1/2" to 2 1/2" square measure were used to sample fish populations in lakes.

Fish scales used for age determination were cleaned and mounted between glass slides, then read using a Bausch and Lomb microprojector.

## FINDINGS

### Goodpaster River Studies

#### Population Estimates:

Two study sections in the lower Goodpaster River were sampled during a one week period in late June to determine population levels of Arctic grayling. During previous sampling by Tack (1974 and 1975), grayling population estimates were made for each of three areas in the entire 185 km (115 mi) of the Goodpaster River. Population estimates in 1975 (Peckham, 1976) and again in this study are limited to two study sections, 4.8 km (3 mi) each, located in the lower 53 km (33 mi) designated as Area I. The fish were captured using electrofishing gear, as in the earlier work. Two or three passes were made through each section to capture fish for marking. Grayling greater than 150 mm were given an upper lobe caudal fin clip. One day was allowed for random mixing of marked fish prior to a final run to examine for recaptures.

The Petersen estimates for grayling in Section 2 (km 4.8-9.6, mi 3-6) and Section 6 (km 24-28.8, mi 15-18) are 323 grayling/km and 368 grayling/km, respectively (Table 1). The estimate for the two study sections combined was 351 grayling/km (563 grayling/mi). This estimate is down from 1975 when the estimate was 475 grayling/km (760 grayling/mi). A comparison of population estimates for the lower Goodpaster River from 1973-1976 is presented in Table 2.

The lower estimate in 1976 may have been partly due to lower water levels in the Goodpaster River which resulted in reduced habitat. Although the sampling was done at the same time as in 1975, the water level was approximately 1 m lower. Also water temperature in 1976 was 16°C compared to 10°C in 1975.

#### Age and Length Frequency Data:

Age determinations by scale analysis were made from a random subsample of 60 grayling from each of the two study sections. Age class IV was the predominant age group comprising 36% of the total subsample (Table 3) while age class V accounted for about 21%. In 1975 age classes III and IV comprised 52% and 7% of the total sample (Peckham, 1976).

Table 1. Population estimates for Arctic grayling (greater than 150 mm) in two sections of the Goodpaster River, June 21-24, 1976.

Section	Marked fish in Population (m)	Fish Examined (c)	Recaps (R)	Petersen Est (N) *	GR/km	GR/km
2 (km 4.8-9.6)	155	99	9	1,550	323	517
6 (km 24-28.8)	202	165	18	1,765	368	588
2 & 6 Combined	357	264	27	3,379	351	563

$$* N = \frac{(m)(c + 1)}{(R + 1)}$$

Table 2. A comparison of population estimates for Arctic grayling (greater than 150 mm) in the lower Goodpaster River for 1973-1976.

Year	Method of Estimate	Length of Area km	Area mi	Population Estimate GR/km	GR/mi
1973	Schnabel	53.0	33	480	770
1974	Petersen	53.0	33	201	323
1975	Petersen	9.6	6*	475	760
1976	Petersen	9.6	6	351	563

\* The 6 miles for which the

The actual abundance of age class I was noted to be much higher than indicated in Table 3. Grayling from 70-120 mm were observed to be common during shocking. Age classes II and III may not be accurately represented also, due to the greater difficulty of netting small fish because they are less effectively stunned by the boat shocker.

The length frequency of 357 grayling greater than 150 mm in length sampled in the two study sections is shown in Table 4. The most abundant size group was grayling having a fork length of 190-209 mm. Grayling greater than 289 mm comprised only 2% of the total. The mean length of the total sample was 214 mm.

#### Capture Rate:

The capture rate of the fish species collected during electrofishing was recorded to provide an index of their relative abundance. The index may be biased by the fact grayling was the target species and more effort was directed toward their capture; however, the data should reveal trends in population abundance when compared with data from prior years.

The relative abundance of grayling in Section 2 and 6 in terms of grayling captured per hour was 64 and 97, respectively. In the two sections combined the relative abundance of grayling, round whitefish, and suckers, Catostomus catostomus as revealed by fish captured/hour was 78, 31 and 19, respectively. This compares with capture rates in 1975 of 172 grayling, 50 round whitefish and 14 suckers/hour.

The reduction in habitat as a result of low water levels, coupled with decreased shocking efficiency when waters are low and clear, probably accounts for the lower capture rate for grayling and round whitefish in 1976.

Northern pike and burbot were captured at a rate of 4.2 and 1.4 fish/hour respectively. Other fish species captured at a rate of less than one fish/hour included Arctic lamprey, Lampetra japonica (Martens), slimy sculpin, Cottus cognatus Richardson and king salmon, O. tshawytscha (Walbaum).

#### Shaw Creek Studies

##### Fish Population Abundance:

Fish populations in Shaw Creek were sampled in July using electrofishing gear to determine species composition and relative abundance. The portion of stream sampled was from Caribou Creek downstream, a distance of approximately 4.8 km (3 mi). Back-up water from the Tanana River, another 4.8 km downstream, reached the lower end of the study section. The total stream length of Shaw Creek is over 60 km (40 mi). Riverboat access is limited to the lower 10 km due to a large number of fallen trees in the stream above that point.



Table 3. Age frequency and length of Arctic grayling\* captured in two sections (Sections 2 and 6) of the Goodpaster River, June, 1976.

Age Class	Number	Percent	Length (mm)	
			Range	$\bar{x}$
I	1	1	108	...
II	13	11	125-168	149
III	13	11	159-241	187
IV	44	36	184-242	209
V	25	21	212-283	240
VI	22	18	230-333	264
VII	1	1	285	...
VIII	1	1	364	...
	<u>120</u>			

\* A sample of 120 fish was comprised of the first 60 grayling captured in each study section.

Table 4. Length frequency of Arctic grayling over 150 mm in two sections (Sections 2 and 6) of the Goodpaster River, June, 1976.

Length Range (mm)	Number
150-169	42
170-189	34
190-209	100
210-229	74
230-249	61
250-269	26
270-289	13
290-309	2
310-329	2
330-349	2
350-369	1
	<u>357</u>

$\bar{x}$  = 214 mm

In much of the study section the electrical field covered the entire stream width; however, boat shocking was difficult due to the amount of logs and debris and the narrowness of the creek. Because of the dark humic stain of the water, only fish near the surface were visible.

Three separate runs were made through the section on July 21, 27 and 30. All grayling greater than 150 mm captured during the first and second runs were marked by clipping a portion of the upper caudal lobe. No marked recaptures were taken during the second or third runs. A total of 89 grayling was captured in 3.75 hours actual shocking time for a capture rate of 23 grayling/hour. Round whitefish, humpback whitefish, Coregonus pidschian (Gmelin) and suckers were captured at rates of 7, 4 and 33 fish/hour, respectively. Burbot and slimy sculpin were captured at a rate of less than one fish/hour.

#### Age and Length Frequency Data:

Scales from all grayling captured were examined for age determination. Forty (45%) of the 89 grayling sampled were age class II. Age composition is shown in Table 5. The mean length of the sampled fish was 195 mm.

Length frequency of the grayling sampled is presented in Table 6. Grayling in the 150-169 mm size group were the most common. Grayling larger than 289 mm comprised less than 6% of the total.

#### Angler Pressure and Sport Fish Harvest Estimates

##### Quartz Lake:

Quartz is a 1,500 acre lake located near the Richardson Highway approximately 16 miles north of Delta Junction. The lake was rehabilitated in 1970 with powdered rotenone to eliminate stunted northern pike and least cisco, Coregonus sardinella Valenciennes, and has been restocked annually with rainbow trout.

A vehicle traffic counter was installed during the summer season on the single access road leading to Quartz Lake. Over 1,100 vehicles were recorded during Memorial Day weekend alone. The total vehicle count of 9,382 from May 14 to October 8 was reduced by 22% to compensate for an overcount resulting from boat and camp trailers. This provides an adjusted vehicle count of 7,318 which when multiplied by an average of 2.5 anglers/vehicle results in an estimated 18,295 man-days of effort for the summer season. The estimate based on the vehicle count does not account for anglers fishing more than one day. This underestimate partially compensates for an overcount due to non-fishing related traffic.

During creel census conducted periodically during the summer season, 92 anglers interviewed had a catch success of 0.13 fish/hour, down from 0.43 and 0.42 recorded in 1974 and 1975, respectively. While the 1976 recorded catch success is lower than in prior years it compares closely with 0.18, 0.15 and 0.12 fish/hour recorded for Birch Lake in 1970, 1971 and 1972, respectively (Peckham, 1973). The total estimated rainbow

Table 5. Age frequency and lengths of Arctic grayling captured in Shaw Creek, July, 1976.

Age Class	Number	Length (mm)	
		Range	$\bar{x}$
I	13	109-145	126
II	40	135-222	163
III	14	167-244	210
IV	11	227-278	247
V	4	278-299	285
VI	6	270-320	293
VII	0	...	...
VIII	<u>1</u>	392	...
	89		

Table 6. Length frequency of Arctic grayling captured in Shaw Creek, July, 1976.

Length Range (mm)	Number
90-109	1
110-129	7
130-149	11
150-169	19
170-189	12
190-209	4
210-229	12
230-249	7
250-269	4
270-289	7
290-309	3
310-329	1
330-349	0
350-369	0
370-389	0
390-409	<u>1</u>
	89

n = 89

$\bar{x}$  = 195 mm

trout harvest for the summer was 8,180. The catch ranged in length from 250 to 508 mm and averaged about 432 mm. The lower catch success is believed to be partially due to a moderate winterkill observed following the winter of 1975-1976, discussed later.

A creel census was also periodically conducted during the winter of 1975-1976. From late November until late April, 73 anglers were interviewed. A total of 74 rainbow trout were harvested at a catch rate of 0.24 fish/hour. During the period of April 6 to May 14, the traffic counter recorded 2,034 vehicles or 54/day. However, the percentage of non-fishermen driving into the lake during the period was probably high.

#### Fielding Lake and Tangle Lakes:

Angler use and fishing success were calculated on Fielding Lake and Tangle Lakes utilizing combined vehicle traffic counts (with road tube and counter) and angler interviews. Interviews were conducted on 12 randomly chosen census dates for each lake, including six weekend and six weekday periods from June 15 to September 5. Interviews provided information on people/vehicle, anglers/vehicle, length of stay, resident status and catch success. Actual counts of boat and camp trailers were made to provide a correction factor for vehicle counts. The results are summarized in Tables 7 and 8. The pressure estimates based on combined vehicle traffic counts and personal interviews are probably high even though actual vehicle counts were reduced by 30% on Tangle Lakes and 50% on Fielding to compensate for trailers and non-fishermen. The largest amount of traffic not related to fishing use was on Fielding Lake where a number of pipeline workers and their families camped in tents and travel trailers. Although this segment of people also fished, the amount of fishing effort was not accurately represented by the increased vehicle traffic.

Grayling is the predominant species harvested in both lakes while lake trout, round whitefish and burbot also enter the catch.

#### George Lake:

George Lake, located about 40 miles east of Delta Junction, continues to be the most heavily utilized northern pike fishery in the Delta area. Civilian and military anglers from the Delta and Fairbanks area are the principal users. Fishing pressure is heaviest from breakup (usually in early June) until mid July.

The 4,500 acre lake is east of the Tanana River and therefore is accessible only by riverboat or float plane. Float plane use is presently light.

During 1976, 85% of the people fishing George Lake launched their own boats at George Lake Lodge near Mile 1385 Alaska Highway or were transported by the lodge owner. The remaining anglers launched at a landing about 15 miles downstream on the Tanana River.

Angler use and success was obtained from a questionnaire given to people launching boats or being transported from the private landing at

Table 7. Fielding Lake creel census summary, June 15-September 4,

Number anglers contacted	143
% resident	81
% non-resident	19
Total hours fished	508
Man hours/angler	3.6
Number fish caught	192
Grayling	156
Lake trout	12
Burbot	24
Fish/hour	0.38
Angler days*	7,749
Angler hours	27,896
Number fish/harvested	10,600
Number fish/angler	4.1

\* Estimates were made based on vehicle traffic counts and personal interviews.

Table 8. Tangle Lakes creel census summary, June 16-September 5, 1976.

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Number anglers contacted	319
% resident	88
% non-resident	12
Total hours fished	1,048
Man hours/angler	3.3
Number fish caught*	646
Grayling	629
Lake trout	14
Burbot	3
Fish/hour	0.62
Angler days*	9,947
Angler hours	32,825
Number of fish harvested	20,351
Number fish/angler	3.9

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\* Includes 135 grayling caught and released.

\*\* Estimates were made based on vehicle traffic counts and personal interviews.

George Lake Lodge. The reports were returned to the lodge owner upon completion of the trip. Information obtained included the date, number of anglers in the party, length of stay, number of northern pike caught and released, and number of northern pike kept. A record of people using the lodge landing as well as the number of people observed on the lake that entered from another point was also kept by the owner of the lodge.

In addition, creel census interviews conducted by Department personnel during June provided catch rate and size of fish harvested which in past years have been relatively consistent through the summer. Creel census data gathered are summarized in Table 9. The length range of northern pike usually retained was 508-965 mm with a mean of approximately 635 mm.

#### Assessment of Anadromous Fish Populations

A total of 1,920 silver salmon was enumerated in the Delta Clearwater River on October 21 and 22, 1976. An additional 460 were counted in the Clearwater Lake outlet. Counts were made from a riverboat utilizing a platform elevated approximately 6 feet.

Sport fish harvest is nearly nonexistent since the quality of the fish is poor when they reach the river.

An egg take was conducted during October 14-16. Approximately 206,000 eggs were taken utilizing 66 females.

#### Fish Stocking Evaluation

Fourteen lakes stocked with rainbow trout or silver salmon or both were sampled with gill nets for evaluation of growth and survival of stocked fish. Netting results and population characteristics are summarized in Table 10. Most lakes were sampled with two gill nets fished overnight for a period ranging from 20 to 24 hours. Four small lakes were sampled with only one gill net.

Due to low water levels many of the managed lakes are not being stocked annually as they were in past years. In 1975 only five lakes were stocked. Quartz, Rapids and North Twin lakes received rainbow trout (Ennis, Montana strain), while Bolio and Donnelly lakes were stocked with silver salmon (from Bear Lake).

A significant winterkill on Quartz Lake due to late winter oxygen depletion is believed to account for the low net catch as compared to previous years. Dissolved oxygen recorded on March 18, 1976, at 1.5 m depth at two locations was 2.2 and 2.4 ppm. Again on April 6 recorded dissolved oxygen remained low at 2.4 ppm. Observations soon after ice breakup confirmed that a moderate winterkill had occurred. Although some evidence of winterkill has been observed each winter, the number of dead fish observed on the lake bottom in depths less than 4 m was greater. Both Age I and older fish were affected. Only 12 rainbow trout were captured in two overnight gill net sets during fall netting. The capture rate was 0.30 fish/net hour compared to a previous low of 0.48

Table 9. George Lake creel census summary, June 5-September 4, 1976.

Anglers	340
Average length of stay (days)	2.2
Angler days	748
Angler hours	3,964
NP* caught	4,284
NP kept	1,700
NP caught and released	2,584
NP/hour (total caught)	1.08
NP/hour (kept)	0.43
NP kept/angler	5.0

\* NP - Northern Pike



Table 10. Population characteristics of stocked lakes determined by graduated mesh gill nets, Interior Alaska, 1976.

Lake	Date Sample	Species	No.	Age Class	Length (mm)		Freq.	Date Stocked	Total No.	/lb	/acre	Source
					Range	Mean						
Bolio	Aug 18	SS	63	I	148-180	163	1.45	7/17/75	11,800	369	118	Bear L.
Craig	Aug 25	SS	4	III	214-245	227	0.17					
		CH	28	...	80-120	...	1.17					
Donna	Sept 10	SS	4	0	94-107	102	0.10	8/24/76	23,100	174	398	Bear L.
		RT	2	IV	429-430	430	0.05					
		RT	1	V	480	...	0.02					
Little Donna	Sept 10	RT	16	II	360-408	381	0.39	7/23/74	16,300	279	339	Winthrop
		RT	2	IV	423-425	424	0.05					
		RT	1	V	470	...	0.02					
Donnelly	Aug 20	SS	42	I	116-291	169	1.86	7/17/75	8,850	369	148	Bear L.
Ft. Greely #2	Aug 20	RT	8	II	142-220	166	0.35	7/10/74	10,000	588	1,250	Winthrop
Jan	Sept 15	SS	10	II	241-261	248	0.23	7/23/74	4,350	227	100	Clearwater
		RT	8	0	87-96	...	0.18					
		RT	13	III	328-368	351	0.30					
Lisa	Aug 25	SS	20	II	180-225	199	0.42	7/23/74	9,900	227	200	Clearwater
Mark	Aug 18	RT	8	III	262-336	287	0.17					
North Twin	Aug 18	RT	29	I	194-284	229	0.61	7/24/75	15,000	171	652	Ennis
South Twin	Aug 18	SS	12	III	210-286	256	0.25					
Rapids	Aug 20	RT	3	I	109-133	118	0.13	7/24/75	2,000	171	400	Ennis
		RT	2	II	196-210	203	0.09					
		RT	1	III	275	...	0.04					
Quartz	Sept 8	RT	2	I	274-289	282	0.05	7/24/75	210,000	171-186	140	Ennis
		RT	8	II	331-413	384	0.20	7/29/75				
		RT	2	III	422-425	424	0.05	7/10-8/28/74				
Rainbow	Sept 9	RT	23	II	326-403	364	0.69	6/26/74	19,000	1,017	406	Winthrop
								7/10/74	20,000	588		

\* RT - Rainbow trout  
 SS - Silver salmon  
 CH - Lake char

during under-ice netting in 1973 (Peckham, 1974). Only two Age I rainbow trout of the 1975 plant were captured having a mean length of 282 mm. These fish were 171-186/lb or about 60 mm in length when stocked in July, 1975.

Twenty-nine Age I rainbow trout of the Ennis, Montana strain were netted at a rate of 0.61 fish/net hour in North Twin Lake. After almost 13 months of lake residency these fish ranged from 194-284 mm and had a mean length of 229 mm. These fish were the first planted since the lake was rehabilitated in 1973. Size at stocking was 171/lb and about 60 mm in length.

Three rainbow trout of the Ennis, Montana strain were netted in Rapids Lake. Slow growth of stocked fish is typical of this small lake located at an elevation of 2,375'. Length range of these Age I fish was 109-133 mm with a mean of 118 mm. When planted these fish were the same size as those stocked in North Twin Lake, previously mentioned. Growth comparisons of Age I rainbow trout of the Ennis strain sampled in 9 lakes in 1972 and 1973 (Peckham, 1974), revealed a length range of 129-335 mm and a mean of 206 mm following about 13 months lake residency.

Net catch of Age II rainbow trout was relatively high in three lakes sampled in 1976. Catch/net hour was 0.39, 0.35 and 0.69 in Little Donna, Ft. Greely #2 and Rainbow lakes respectively. Growth was similar in Little Donna and Rainbow where mean lengths were 381 mm and 364 mm, respectively, 25 months after stocking. Stocking rate was nearly equal at 339/acre in Little Donna and 406/acre in Rainbow; however, the size of fish stocked in Little Donna was larger, 279/lb, compared to 588-1,017/lb for those planted in Rainbow Lake.

The slower growth rate of rainbow trout stocked in previously barren Ft. Greely #2 is probably due to the higher stocking density of 1,250/acre. Rainbow trout stocked in each of the three lakes were of the Winthrop, Washington strain.

Net catches of fish beyond Age II are usually too small to allow growth or survival comparisons.

Silver salmon from the Bear Lake source that were stocked in Bolio and Donnelly lakes in July, 1975 were sampled 13 months later and showed similar growth. Those sampled in Bolio had a length range of 148-180 mm and a mean of 163 mm, while the length range of the Donnelly Lake fish was 116-291 mm with a mean of 169 mm. Fish stocked in each lake were 369/lb or approximately 50 mm in length. Donnelly was a barren lake prior to being stocked for the first time in 1975.

Growth of Age I silver salmon was similar to that recorded from 1973-1975 (Peckham, 1974, 1975 and 1976). Survival was high in both lakes as indicated by high net catches of 1.45 fish/hour in Bolio Lake and 1.86 in Donnelly Lake.

Age II silver salmon of the Delta Clearwater source were netted in Jan and Lisa lakes at rates of 0.23 and 0.42 fish/hour, respectively. Catch

rate and size of fish captured appears to reflect stocking density. silver salmon stocked in July, 1974 were 227/pound for both lakes; however, Jan Lake received 100 fish/acre while Lisa Lake had 200 fish planted. The size range of 10 silver salmon netted in Jan Lake was 226-261 mm with a mean of 248; whereas, 20 fish caught in Lisa Lake range from 180-225 mm and had a mean length of 199 mm.

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